

ACCESSION NR: AP4042576

cant. It is shown that the equations for the reaction amplitudes, in which the final state consists of two pairs of interacting particles, are coupled to those in which there are three interacting particles. The kernels of these equations contain the amplitude for three-nucleon interactions in the same manner as the kernel for the equation for the three-nucleon interactions contain the two-nucleon scattering amplitude. As in the case of the previous investigation of nucleon-deuteron scattering, it is possible to represent the amplitudes of the different processes of four-nucleon interaction in the form of contributions from an infinite sum of diagrams. An investigation of the structure of these contributions makes it possible to write down integral equations for the amplitudes of the reactions. For the sake of simplicity it is assumed that the particles possess neither spin nor isospin, but generalization to the case of particles with spin entails no difficulty in principle, and can be carried out by the method which the authors have used to solve the three-body problem. It is planned in the future to obtain integral

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Soviet certificates of invention. Khar. prom. no.2:57-59 Ap-Je '65.
(MIRA 18:5)

KOMAROV, V.V.

~~Bread-making machine.~~ Khleb. i kond. prom. 1 no.2:18-22 F '57.

(MLRA 10:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khlebopekarnoy
promyshlennosti.

(Bakers and bakeries--Equipment and supplies)

MOREV, N.Ye.; SHUL'TS, I.A.; KOMAROV, V.V.; SMOLYANSKIY, N.A.; SOKOLOV, A.G.

Mechanized TsNIIKHP-M2-59 make production line with a daily capacity up to 15 tons of hearth bread weighing from 0,4 to 1,2 kg a piece. Trudy TSNIIKHP no.8:5-10 '60. (MIRA 15:8)
(Bakers and bakeries—Equipment and supplies)
(Assembly-line methods)

MOREV, N.Ye.; SHUL'TS, I.A.; KOMAROV, V.V.; SMOLYANSKIY, N.A.;
SOKOLOV, A.G.

Equipment for the mechanization of manual processes in the
production of cracknel baked products. Trudy TSNIKHHP no.8:20-
28 '60. (MIRA 15:8)
(Bakers and bakeries--Equipment and supplies)

KOMAROV, V.Ye.; MANEVICH, Ye.L., doktor ekonom.nauk, otv.red.; BAKOVETSKAYA,
~~V.S.~~, red.izd-va; RYLINA, Yu.V., tekhn.red.

[Economic basis of training specialists for the national economy]
Ekonomicheskie osnovy podgotovki spetsialistov dlia narodnogo
khoziaistva. Moskva, Izd-vo Akad.nauk SSSR, 1959. 206 p.
(MIRA 12:12)

(Technical education)

S/137/61/000/005/004/060
A006/A106

AUTHORS: Komarov, V.Ye., Smirnov, M.V., Baraboshkin, A.N.
TITLE: Equilibrium potentials of zirconium in a molten equimolar mixture of sodium and potassium chlorides

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 5, 1961, 16, abstract 5A93 ("Tr. In-ta elektrokhemii, Ural'skiy fil. AN SSSR", 1960, no. 1, 17 - 22)

TEXT: The authors measured equilibrium Zr potentials in a molten equimolar mixture of Na and K chlorides containing from 0.16 to 6.8 weight % Zr in a temperature range of 687 - 978°C. The replacement of Li⁺ ions by Na⁺ ions, shifts the equilibrium Zr potential toward the side of more negative values and increases the heat of formation of Zr from di- and tetrachloride components, dissolved in chloride melts of alkaline metal. The authors established the temperature dependences of electrode potential constants in thermodynamical equations: $E_{Zr/Zr^{4+}}^0 = -2.55 + 6.7 \cdot 10^{-4} T [b]$; $E_{Zr/Zr^{4+}}^0 = -2.63 + 6.7 \cdot 10^{-4} T [b]$; $E_{Zr/Zr^{2+}}^0 =$

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Equilibrium potentials ...

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= - 2.69 - 6.7 · 10⁻⁴ T [b]. An evaluation was made of the value of the heat of
ZrCl₄ dissolving and of the heat of formation of complex ZrCl₆²⁻ anions in a NaCl+
+KCl melt. ✓

T. K.

[Abstracter's note: Complete translation]

Card 2/2

KOMAROV, V. YE.

5.4600

81869
S/020/60/133/02/45/068
B004/B064

AUTHORS: Smirnov, M. V., Komarov, V. Ye., Baraboshkin, A. N.
TITLE: Equilibrium Potentials of Zirconium in Mixed Fluoride - Chloride Melts
PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 2, pp. 409 - 412

TEXT: The authors carried out their investigations in equivalent mixtures from KCl + NaCl under addition of different amounts of fluorides at 700 - 950°C. The melt was produced from chemically pure salts, the zirconium being introduced by means of anodic dissolution of its iodide into the melt directly in the test cell (Fig. 1). Argon served as protective atmosphere. The potentials of melts 0.17 up to 1.05 wt% Zr and up to 15.82 wt% F were measured. The molar ratio of concentration $[F]/[Zr]$ was varied between 9 and 75. The experiments showed that the potential of Zr is more strongly influenced by the concentration of fluorine than by its own concentration. A reaction equation is written down for the formation of the zirconium - fluoride complexes, in which

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Equilibrium Potentials of Zirconium in Mixed
Fluoride - Chloride Melts

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S/020/60/133/02/45/068
B004/B064

the number of F ions that are bound to Zr as complexes is designated with m, the average valency of Zr with n. The equation

$E = \text{const} - 1.984 \cdot 10^{-4} T \log [F^-]$ is set up for the dependence of the potential on the concentration of the free fluorine ions. It was checked at 770°C, variation of the fluorine content of 2.04 to 15.82 wt% and constant Zr concentration of 1.05 ± 0.2 wt%. The graphical representation of the experimental data (Fig. 2) yields for $m = 6, 5, 4$ straight line, for which empirical equations are written down. The change of m and n is discussed and the following found: $4 \geq n > 2, 5$. Formation of different ions at $[F]/[Zr] > 10$ and $[F]/[Zr] < 10$. Fig. 3 shows the results of experiments at temperatures of from 500 to 1250°K for five melts with $[F]/[Zr]$ from 45 to 9, for which also empirical equations were written down. Assuming that in the case of 10 - 15 wt% Zr the fluoride - chloride melts behave in a similar way as if thorium were added (Ref. 3), the equation is written down for the equilibrium potential. In the case of an excessive quantity of fluorine $75 > [F]/[Zr] > 10$ as occurs in the practical electrolysis of fluorine zirconate, it holds that $4 > n > 3$ and $6 > m > 4$. For approximative

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RUDENSKIY, Lev Veniaminovich[deceased]; KHROMOY, Ruvim Samoylovich; LENKOV, Aleksandr Yakovlevich; FAYNBERG, Yuliy Konstantinovich; SALIT, Yevsey Solomonovich; KAUFMAN, Grigoriy Emmanuilovich; KHIZHINSKIY, Leonid Yakovlevich; KOMAROV, Vasilii Yefimovich; TSYRUL'NIKOV, Abram Iosifovich; ROZENTSVEYG, Ya.D., red.izd-va; MAIKHAYLOVA, V.V., tekhn. red.

[Study of materials] Materialovedenie. By L.V.Rudenskii i dr. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1961. 476 p. (MIRA 14:12)

(Materials)

S/137/62/000/009/002/033
A006/A101

AUTHORS: Smirnov, M. V., Komarov, V. Ye., Baraboshkin, A. N.

TITLE: Equilibrium between hafnium metal and NaCl-KCl melts containing its ions

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 9, 1962, 8, a stract 9A40
("Tr. In-ta elektrokhimii; Ural'skiy fil. AN SSSR", 1961, no. 2, 9 - 17)

TEXT: The emf method was used to study the equilibrium between Hf metal and a molten equimolar NaCl-KCl mixture, containing 0.16, 0.76 and 1.51 weight % Hf. Emf was measured in respect to the chlorine comparison electrode in a thermostated cell with chlorine and hafnium electrodes in a range from 692 - 954°C. It was established that the experimental points were satisfactorily located on the straight lines, corresponding to empirical equations:
 $E_1 = 2.572 - 3.75 \cdot 10^{-4} T \pm 0.002 \text{ b}$; $E_2 = 2.598 - 4.47 \cdot 10^{-4} T \pm 0.005 \text{ b}$;
 $E_3 = 2.617 - 4.84 \cdot 10^{-4} T \pm 0.005 \text{ b}$. Isotherms of Hf electrode potentials, represented in the coordinates ion-fractional concentrations on a logarithmic

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Equilibrium between hafnium metal and...

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scale versus equilibrium Hf potentials, are not straight lines. The bending of isotherms is caused by the presence of ions of different valences in the commensurable quantities. The magnitude of mean Hf valence in the electrolyte at different concentrations is determined from the inclination of tangents to the isotherms. Equations are found for the temperature dependence of equilibrium constants of the reaction $\text{Hf}_{(\text{melt})}^+ + \text{Hf} = 2\text{Hf}_{(\text{melt})}^{2+}$ and standard values of electrode potentials:

$$\lg K = -0.329 - 2820/T$$

$$E_{\text{Hf}/\text{Hf}^{2+}}^{\circ} = -2.51 + 6.3 \cdot 10^{-4} T; \quad E_{\text{Hf}/\text{Hf}^{4+}}^{\circ} = -2.65 + 6.2 \cdot 10^{-4} T;$$

$E_{\text{Hf}^{2+}/\text{Hf}^{4+}}^{\circ} = -2.79 + 6.0 \cdot 10^{-4} T$. The authors calculated changes in the isobaric potential Δz at reactions of HfCl_4 and HfCl_2 formation and HfCl_4 reduction in HfCl_2 by hafnium metal.



$$\Delta z = -245,000 + 55.0 T \text{ cal/mole}$$

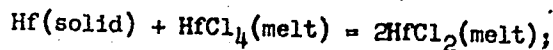


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Equilibrium between hafnium metal and...

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A006/A101

$$\Delta z = -116,000 + 27.7 T \text{ cal/mole}$$



$$\Delta z = 13,000 + 0.40 T \text{ cal/mole}$$

G. Prents

[Abstracter's note: Complete translation]

Card 3/3

S/137/62/000/009/004/033
A006/A101

AUTHORS: Komarov, V. Ye., Smirnov, M. V.

TITLE: Equilibrium potentials of hafnium in mixed fluoride-chloride melts

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 9, 1962, 12, abstract 9A67
("Tr. In-ta elektrokhemii Ural'skiy fil. AN SSSR", 1961, no. 2,
19 - 22)

TEXT: The authors measured equilibrium Hf potentials in NaCl-KCl-xNaF melts, containing 0.99 - 3.4 weight % Hf and 1.36 - 15.8 weight % F, at 700, 800 and 900°C. Equations were derived for the equilibrium Hf potential as a function of temperature and electrolyte composition. An equation was found for the temperature dependence of the instability constant of a complex HfF_6^{2-} anion, formed in NaCl-KCl melts with NaF admixtures.

L. Povedskaya

[Abstracter's note: Complete translation]

Card 1/1

54700

28309

S/081/61/000/016/016/040
B141/B101

AUTHORS: Komarov, V. ⁴/_{E.}, Smirnov, M. V., Baraboshkin, A. N.

TITLE: Equilibrium potentials of zirconium in molten equimolar mixture of sodium chloride and potassium chloride

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 16, 1961, 76, abstract 16551 (Tr. In-ta elektrokhemii. Ural'skiy fil. AN SSSR, no. 1, 1960, 17 - 22)

TEXT: In addition to previous paper (RZhKhim, 1959, no. 2, 3998), the equilibrium potentials of zirconium in an equimolar mixture of potassium and sodium chlorides were measured with a zirconium content of 0.16 - 6.8% by weight at 678 - 978°C. Substitution of Li^+ by Na^+ ions shifted the equilibrium potentials of zirconium in negative direction, and increased the heat of formation from the elements of zirconium di- and tetrachlorides solved in alkali chloride melts. Expressions were found for the temperature dependence of the equilibrium potentials of the systems $\text{Zr} - \text{Zr}^{2+}$, $\text{Zr} - \text{Zr}^{4+}$, $\text{Zr}^{2+} - \text{Zr}^{4+}$. The standard heat of formation of ZrCl_4 from elements in a melt of given composition is -242 kcal/mole, whereas that of ZrCl_6^{2-} X
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S/137/62/000/008/010/065
A006/A101

AUTHORS: Smirnov, M. V., Komarov, V. Ye., Baraboshkin, A. N.

TITLE: Behavior of zirconium and hafnium during fused salt electrolysis

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 8, 1962, 26, abstract 8G186
("Tr. In-ta elektrokhimii, Ural'skiy fil. AN SSSR", 1961, no. 2, 23 - 28)

TEXT: During Zr deposition from fluoride-chloride melts (e.g. in K_2ZrF_6 electrolysis in a NaCl-KCl melt) Zr and Hf separation is thermodynamically possible; Hf remains in the electrolyte. In such a manner, if $[Hf]/[Zr] = 10^{-2}$ and at $700^\circ C$, cathodic Zr is impoverished of Hf by a factor of 20, and at $650^\circ C$ by a factor of 70. To assure maximum Hf and Zr separation, possible at the given temperature, electrolysis should be conducted in such a way that the ratio of Hf and Zr concentration near the cathode should remain the closest possible to their relationship in the electrolyte volume. According to the difference of oxidizing-reducing potentials, a dependence was established of the degree of Hf reduction on the degree of Zr reduction in chloride melts.

[Abstracter's note: Complete translation]

G. Svodtseva

Card 1/1

40824

5.4700

S/631/61/000/002/005/013
I003/I203

AUTHORS: Smirnov, M. V., Baraboshkin, A. N., Saltykova, N. A., and Komarov, V. Ye.
SOURCE: Akademiya nauk SSSR. Ural'skiy filial. Institut elektrokhimii. Trudy, no. 2, 1961. Elektrokimiya rasplavlennykh soleykh i tverdykh elektrolitov. 63-69
TITwE: Cathodic processes during deposition of hafnium from chloride and chloride-fluoride fused salts

TEXT: There are no published data on the electrode processes of the electrolysis of fused salts containing hafnium. The cathodic polarization of molybdenum and tungsten in chloride and chloride-fluoride fused salts containing hafnium was investigated by measuring their electrode potentials against a chlorine reference electrode. Current densities were from 10^{-4} to 2 amp/cm² and the temperature range from 700 to 900°C. Hafnium was introduced into the fused salts by addition of hafnium tetrachloride or by anodic dissolution of the pure metal in the bath. The presence of fluorine ions in fused chloride salts decreases the deposition potentials of hafnium and decreases the concentration polarization, particularly when the F/Hf molar ratio is 6. There are 5 figures.

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KOMAROV, V.Ye.; SMIRNOV, M.V.; BARABOSHKIN, A.N.

Anodic solution of zirconium and hafnium in fused salts. Trudy
Inst. elektrokhim. UFAN SSSR no.3:25-39 '62. (MIRA 16:6)

(Zirconium) (Hafnium)
(Fused salts—Electric properties)

SMIRNOV, M.V.; BAYEVA, T.F.; KOMAROV, V.Ye.

Chronopotentiometric method of measuring the diffusion
coefficients of tetravalent hafnium in chloride and fluoride-
chloride melts. Trudy Inst. elektrokhim. UFAN SSSR no.3:
59-64 '62. (MIRA 16:6)

(Hafnium compounds) (Diffusion)
(Fused salts) (Potentiometric analysis)

43055

8/826/62/000/000/005/007
D408/D307

5.4700

AUTHORS:

Smirnov, M.V., Baraboshkin, A.N., Komarov, V.Ye.
and Saltykova, N.A.

TITLE:

Cathodic and anodic processes during the
electrolysis of chloride and fluoride-
chloride containing zirconium and hafnium.

SOURCE:

Fizicheskaya khimiya rasplavlennykh soley i
shlakov; trudy Vses. soveshch. po fiz.khimii
raspl. soley i shlakov, 22 - 25 noyabrya 1960
g., Moscow, Metallurgizdat, 1962, 257 - 265

TEXT:

A continuation of previous investigations of
electrode processes during the electrolysis of chloride and
fluoride-chloride melts containing other polyvalent transition
metals. Anodic and cathodic polarization curves were obtained
by measuring the electrode potentials at the moment of switching
on the polarizing current. Polarization curves are presented for
e.g. the anodic solution of Zr and Hf in molten equimolar mixtures

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of NaCl and KCl at 800°C, for an Mo cathode in NaCl--KCl melts to which a) specific amounts of ZrCl₄ (2.5 wt.%) or HfCl₄ (3.6 wt.%) were added, at 800°C, and b) 0.9 wt.% Zr was introduced by anodic solution of the metal, at 900, 800, and 700°C, and for an Mo cathode in fluoride-chloride melts (at 800°C) prepared from NaCl--KCl melts by a) the addition of 2.8 wt.% K₂ZrF₆ or 3.7 wt.% K₂HfF₆ and b) the introduction of 0.95 wt.% Zr by anodic solution of the metal and the addition of sufficient NaF to give molar ratios $[F] / [Zr] = 0, 2, 6, 16 \text{ and } 22$ in the melts. The anode potentials increased continuously with increasing in current density (i) from 10^{-4} to 10 a/cm^2 , indicating that the concentration of Zr ions close to the electrode continuously increased are insoluble Zr chlorides were not formed. Below $3 \times 10^{-3} \text{ a/cm}^2$ concentration polarization was practically absent because the electrolysis current was lower than the self-solution (corrosion) current. In the range $3 \times 10^{-3} - 1 \text{ a/cm}^2$ the plots of electrode potential $v. \log i$ were nearly linear, but above 1 a/cm^2 the curves deviate from linearity, owing mainly to the increase in metal ion concentration at the electrode surface and consequent increase in activity coefficient,

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but partly to change in the diffusion coefficient of the ions in the high concentration region and, thus, to change in the thickness of the diffusion layer. The anodic polarization curves shift to the side of more positive potentials with increase in temperature, but the general character of the dependence of the anodic potential on current density does not change substantially. The following expression was derived for the average valency of the metal ions passing into solution at potential φ :

$$\varphi = E^0_{Me^{4+}/Me^{2+}} + 0.992 \times 10^{-4} \log \frac{n-2}{4-n} \quad (5)$$

where Me--metal; n--average valency of the metal ions = 4 - 2x; x--proportion of Me²⁺. At low i the experimentally found average Hf ion valencies, were lower than those calculated from Eq. (5); at high current densities the experimental results were higher than the calculated ones. The cathodic polarization of Zr and Hf has the same character as that of Th and Ti but, in contrast to the latter

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Cathodic and anodic processes ...

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metals, Zr and especially Hf begin to discharge when the concentrations of M^{2+} and M^{4+} are comparable. For Zr at 800°C $E^0_{Zr^{4+}/Zr^{2+}} = -2.00v$, somewhat more positive than the potential at which the metal is liberated, and the charge exchange, of higher to lower ion valencies, was clearly indicated by an inflection on the polarization curve; For Hf at 800°C $E^0_{Hf^{4+}/Hf^{2+}} = -2.14v$, more negative than the potential at which the metal is liberated, the charge exchange inflection merges with the metal liberation inflection. Polarization curves for the melts in which Zr was introduced by anodic solution of the metal at different temperatures showed that even at low i the potential of the Mo cathode was close to that at which the metal was liberated. In chloride and fluoride-chloride melts, liberation of the metals at the cathodes preceded residual currents which were mainly explained by charge exchange and discharge of impurity ions. Liberation of the metals was accompanied by strong concentration polarization, due mainly to accumulation of free fluoride ions in the vicinity of the cathode. The potential at which zirconium was liberated depended on the $[F]/[Zr]$ ratio. There are 6 figures.

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5.4700

43056
S/826/62/000/000/007/007
D408/D307

AUTHORS:

Smirnov, M.V., Komarov, V.Ye., and
Baraboshkin, A.N

TITLE:

The equilibrium potentials of hafnium and
zirconium in chloride and fluoride-chloride
melts

SOURCE:

Fizicheskaya khimiya rasplavlennykh soley i
shlakov; trudy Vses. soveshch. po fiz. khimii
raspl. soley i shlakov, 22 - 25 noya brya 1960
g. Moscow, Metallurgizdat, 1962, 353 - 360

TEXT:

The above potentials were measured in equimolar
NaCl--KCl melts containing a) 0.16 - 6.8 wt.% Zr, or 0.16 - 1.51
wt.% Hf and b) 2 - 35 wt.% NaF and 0.17 - 1.05 wt.% Zr, or
0.99 - 3.4 wt.% Hf, between 700 and 950°C, to explain processes
occurring during the electrolysis of chloride melts containing
Zr and Hf, to calculate the thermodynamic quantities ΔZ , ΔH ,
and ΔS for the formation of $MeCl_2$ and $MeCl_4$ (Me--Zr or Hf)
from their elements in melts of specific composition, and to
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X

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obtain quantitative data concerning the formation of complexes in molten salts. The proportions of Me^{2+} and Me^{4+} at any specific metal concentration $[Me]$ were determined from the slopes of the isotherms of the equilibrium potentials at 1000, 1100, and 1200°K, and were used to calculate the standard oxidation potentials as a function of temperature. Comparison of the latter showed that the ease of reducibility both of the dichlorides and of the tetrachlorides to the metals was similar for Zr and Hf in NaCl--KCl melts at 700 - 900°C, so that cathodic deposition of Zr from the melts is not an effective process for separating the two metals. On the other hand, $ZrCl_4$ reduces more easily to the dichloride than does $HfCl_4$; at 700°C reduction of 50% $ZrCl_4$ to $ZrCl_2$ is matched by the reduction of only 3.7% $HfCl_4$ to $HfCl_2$. With decreasing temperature disproportionation of the dichlorides to tetrachlorides and free metals occurs more easily for Hf than for Zr. The Zr and Hf equilibrium potentials in fluoride-chloride are more negative than in pure chloride melts, owing to the formation of complexes $MeF_m^{(n-m)-}$, where

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The equilibrium potentials ...

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n is the average valency of the Zr ions. At 770°C in electrolytes containing 2.04 - 15.82 wt.% F and 1.05 ± 0.2 wt.% Zr, the average Zr valency was $4 \geq n \geq 3.23$, when m decreased from 6 to 5. The equilibrium potential of Hf was found to be more negative than that of Zr in melts containing the same concentrations of Me and F ions, the difference in potential decreasing with increasing temperature. HfF_2^- was shown to be slightly more stable than ZrF_6^{2-} . There are 3 figures.

ASSOCIATION: Institut elektrokhimii UFAN (Institute of Electrochemistry UFAS)

Card 3/3

S/186/62/004/005/002/009
E075/E436

AUTHORS: Pushlenkov, M.F., Komarov, Ye.V., Shuvalov, O.N.

TITLE: The influence of the nature of solvents on the extraction of uranyl nitrate with tributylphosphate

PERIODICAL: Radiokhimiya, v.4, no.5, 1962, 543-550

TEXT: The authors studied the dependence of the distribution of $\text{UO}_2(\text{NO}_3)_2$ between water and organic solvents on its concentration in water and evaluated quantitatively the influence of the nature of solvents on the extraction of U and water with tributylphosphate (TBP). The experimental procedure was described previously by the present authors (Radiokhimiya, v.2, no.5, 1960, 537). Distribution coefficient α for the investigated range of U concentrations irrespective of the nature of solvents is given by

$$\alpha = \frac{1}{2} \left[\left(\frac{c_T}{x} + \frac{1}{16Qx^4\gamma_+^3} \right) \pm \sqrt{\left(\frac{c_T}{x} + \frac{1}{16Qx^4\gamma_+^3} \right)^2 - \left(\frac{c_T}{x} \right)^2} \right] \quad (6)$$

where x - equilibrium concentration of U in aqueous solution,
 γ_+ - mean activity coefficient of $\text{UO}_2(\text{NO}_3)$ in water,

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The influence of the nature ...

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c_T - overall concentration of TBP in the organic phase
(TBP · H₂O + free TBP) and

$$Q = \frac{\alpha}{4x^2\gamma_{\pm}^3 (c_T - 2\alpha x)^2} \quad (5)$$

and is related to the total transfer of water and UO₂(NO₃)₂ to the organic phase. The solvents used were: CHCl₃, ClCH₂CH₂Cl, CCl₄ and bromobenzene. The equilibrium constant β for the formation of solvate UO₂(NO₃) · TBP₂ is given by

$$\beta = \frac{\alpha\gamma_S}{4x^2\gamma_{\pm}^3 T^2\gamma_T^2} \quad (1)$$

where γ_S and γ_T are the activity coefficients of the solvate and TBP respectively in the organic phase and T - concentration of free TBP in the organic phase. As this constant is related only to the distribution of UO₂(NO₃)₂, the variation of $(\beta\gamma_T^2)/(\gamma_S)$ produced by changes of the solvents measures quantitatively the

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The influence of the nature ...

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E075/E436

effect of solvents on the distribution. The values Q , $(\beta\gamma_T^2)/\gamma_S$ and β_{water} increase in the order CHCl_3 , $\text{ClCH}_2\text{CH}_2\text{Cl}$, CCl_4 and $\text{C}_6\text{H}_5\text{Br}$. Comparison of $(\beta\gamma_T^2)/\gamma_S$ and β_{water} shows that the distribution of water influences significantly the distribution of U. By changing the concentration of U in the organic phase between 0.1 and 0.5 M and that of TBP between 0.07 and 0.7 M, the above values do not change appreciably, but by increasing the concentration of TBP from 0.7 to 3.3 M the activity coefficients of $\text{UO}_2(\text{NO}_3)_2$ in both CCl_4 and CHCl_3 increase rapidly. CHCl_3 and $\text{ClCH}_2\text{CH}_2\text{Cl}$ decrease the extractive capacity of TBP more than the other solvents due to hydrogen bonding of H in C-H groups, next to C-Cl group, to phosphoric groups. The association constants for CHCl_3 and $\text{ClCH}_2\text{CH}_2\text{Cl}$ are about 7 and 0.6 respectively. The large constant for CHCl_3 explains a rapid decrease in Q with increasing concentration of CHCl_3 in the organic phase. It is indicated that CHCl_3 , as a solvent in the extractions of various salts with TBP, should decrease considerably the distribution coefficients in comparison with the solvents not associating with TBP. Although bromobenzene is more polar than CHCl_3 , $(\beta\gamma_T^2)/\gamma_S$ values for

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The influence of the nature ...

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E075/E436

bromobenzene exceed those for CHCl_3 and CCl_4 by factors of 100 and 2 respectively. This shows that the effect of solvents on the extraction cannot be estimated from their polarities. There are 8 tables and 2 figures.

SUBMITTED: July 7, 1961

Card 4/4

SMIRNOV, M.V. (Sverdlovsk); BARABOSHKIN, A.N. (Sverdlovsk); KOMAROV, V.Ye.
(Sverdlovsk)

Cathodic processes in the deposition of zirconium from chloride
melts. Zhur.fiz.khim. 37 no.8:1669-1676 Ag '63. (MIRA 16:9)

1. Institut elektrokhemii Ural'skogo filiala AN SSSR.
(Zirconium plating) (Fused salts)

SMIRNOV, M.V. (Sverdlovsk); BARABOSHKIN, A.N. (Sverdlovsk); KOMAROV, V.Ye.
(Sverdlovsk)

Cathodic processes in the deposition of zirconium from mixed chloride-
fluoride melts. Zhur.fiz.khim. 37 no.8:1677-1681 Ag '63.
(Zirconium plating) (Fused salts) (MIRA 16:9)

VASIL'YEVA, Yelena Vladimirovna; KOLANOV, Vasiliy Yefimovich;
FILIPPOV, V.V., red.

[Labor conditions and the improvement in the national
welfare] Uslovia truda i rost narodnogo blagosostoiania.
Moskva, Ekonomika, 1964. 181 p. (MIRA 17:10)

L 10881-66 EWT(m)/ETC/ENG(m)/EMP(j)/T/EMP(t)/EMP(b) IJP(c) DS/JL/JW/JG/RM
 ACC NR: AT5028238 SOURCE CODE: UR/2631/65/000/006/0029/0037

AUTHOR: Smirnov, M. V.; Krasnov, Yu. N.; Khazemov, F. F.; Komarov, V. Ye. 48
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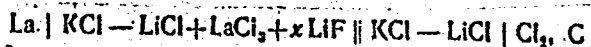
ORG: Institute of Electrochemistry, Ural Branch, Academy of Sciences SSSR (Akademiya nauk SSSR, Ural'skiy filial, Institut elektrokhimii) 44.55

TITLE: Instability constants of fluoride complexes of lanthanum in the molten eutectic mixture LiCl-KCl 27

SOURCE: An SSSR, Ural'skiy filial, Institut elektrokhimii. Trudy, no. 6, 1965. Elektrokhiimiya rasplavlennykh solevykh i tverdykh elektrolitov (Electrochemistry of fused salts and solid electrolytes), 29-37

TOPIC TAGS: lanthanum compound, complex molecule, lithium fluoride, emf 27

ABSTRACT: The emf's of the galvanic cells



were measured at 600-800C, LiF being present in the electrolyte in amounts of 2.5, 5.0, 10, and 20 wt. %. The experimental data showed the existence of the following lanthanum complexes in the melt: LaF^{2+} , LaF_2^+ , and LaF_3 . Expression for the temperature dependence of the instability constants of these complexes were obtained:

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$$\lg K_1 = \lg \frac{[La^{3+}][F^-]}{[LaF_2^+]} = -1.575 - \frac{900}{T};$$

$$\lg K_2 = \lg \frac{[La^{3+}][F^-]^2}{[LaF_2^+]} = -2.305 - \frac{1300}{T};$$

$$\lg K_3 = \lg \frac{[La^{3+}][F^-]^3}{[LaF_3]} = -2.535 - \frac{1800}{T};$$

Expressions derived for their successive dissociation were:

$$\lg K' = \lg \frac{[LaF_2^+][F^-]}{[LaF_3]} = -0.230 - \frac{500}{T};$$

$$\lg K'' = \lg \frac{[LaF_2^+][F^-]}{[LaF_2^+]} = -0.732 - \frac{400}{T};$$

An equation was obtained for the equilibrium potentials of lanthanum in mixed fluoride-chloride melts at $\frac{[F]}{[La]} > 10$:

$$E_{La} = -3.721 + 5.19 \cdot 10^{-4} T + 0.661 \cdot 10^{-4} T \lg \frac{[LaF_3]}{[F^-]} \text{ V}$$

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ACC NR: AT5028238

relative to a chlorine reference electrode.

Fused salts

SUB CODE: 07/ SUBM DATE: none/ ORIG REF: 005

18

jw

Card

3/3

SMIRNOV, M.V.; KOMAROV, V.Ye.; CHUKREYEV, N.Ya.

Fluoride complexes of beryllium in a chloride-fluoride melt. Zhur.
neorg. khim. 10 no.9:2001-2005 S '65. (MIRA 18:10)

Card 1/2

UDC: 541.138: 661.879

ACC NR: AF7002165

produces in the investigated melt a fluoride complex UF_6^{--} . An expression is obtained for the temperature dependence of the instability constant of this complex in the melt. Orig. art. has: 8 formulas and 2 tables.

SUB CODE: 18/

SUBM DATE: 04Jul66/

ORIG REF: 005/

OTH REF: 001

Card 2/2

KOMAROV, Ya.A., volkovnik med. sluzhby

Medical control in public eating establishments. Voen. med. zhur.
no.3:90 Nr '58.

(MIRA 12:7)

(FOOD HANDLING)

KOMAROV, Ye.P., inzh.

Possibilities for increasing the capacity of UMPF-4 machines.

Torf. prom. 35 no.3:9-10 '58.

(MIRA 11:5)

1. Petrovsko-Kobelevskoye terfopredpriyatiye.
(Peat machinery)

Spectrographic determination of chromium in optical glass. B. V. Komarov. *J. Applied Chem.* (U. S. S. R.) 8, 643-0 (in German 640) (1935).—The analysis was carried out with glass which was ground free of Fe and dissolved in HF. The soln. was placed on C electrodes and a spark produced between the electrodes by a 12,000-v. current was recorded on a photographic plate. A table reproducing results of the investigation by the intensity of 3608 Å. and 4254 Å. lines is presented. Seven references.

A. A. Buchtingk

Distr: 4R4J/4E3d7

Formation of peracetic acid in solution
L. D. POGORILSKAYA and A. A. KURKOVA
Zh. Neorg. Khim. 2, 280 (1957) (Chem. Abstr. 52, 12011 (1957))
The authors have studied the kinetics and mechanism of the reaction of acetic anhydride with hydrogen peroxide in the presence of various metal ions. The reaction is first order with respect to hydrogen peroxide and the analysis of the experimental data shows that the reaction proceeds through a complex of hydrogen peroxide with the metal ion. The rate of reaction increases with increasing pH and the rate constant of the reaction is $k = 10^{-4} \text{ min}^{-1}$. The authors also studied the reaction of acetic anhydride with hydrogen peroxide in the presence of various metal ions. The reaction is first order with respect to hydrogen peroxide and the analysis of the experimental data shows that the reaction proceeds through a complex of hydrogen peroxide with the metal ion. The rate of reaction increases with increasing pH and the rate constant of the reaction is $k = 10^{-4} \text{ min}^{-1}$. The authors also studied the reaction of acetic anhydride with hydrogen peroxide in the presence of various metal ions. The reaction is first order with respect to hydrogen peroxide and the analysis of the experimental data shows that the reaction proceeds through a complex of hydrogen peroxide with the metal ion. The rate of reaction increases with increasing pH and the rate constant of the reaction is $k = 10^{-4} \text{ min}^{-1}$.

MASLAKOV, D.I.; KOMAROV, Ye.I., red.; GERASIMOVA, Ye.S., tekhn.red.

[Planning in the fuel industry and methods for determining
fuel reserves and consumption in the U.S.S.R.] Planirovanie
toplivnoi promyshlennosti i metodika sostavleniia toplivnogo
balansa SSSR. Moskva, Gosplanizdat, 1958. 62 p. (MIRA 12:3)
(Fuel)

KRASNOV, Isay Borisovich; KOMAROV, Ye.I., red.; PONOMAREVA, A.A.,
tekhn.red.

[Planning over-all electrification] Planirovanie elektrifikatsii
narodnogo khoziaistva. Moskva, Gosplanizdat, 1958. 63 p.
(Electrification) (MIRA 12:6)

MACHIKHIN, Viktor Pavlovich; KOMAROV, Ye.I., red.; GERASIMOVA, Ye.S.,
tekhn.red.

[Planning of local State and cooperative industry] Planirovanie
mestnoi gosudarstvennoi i kooperativnoi promyshlennosti. Moskva,
Gosplanizdat, 1958. 73 p. (MIRA 12:6)
(Russia--Industries)

SADOMSKIY, Anatoliy Mikhaylovich; KOMAROV, Ye.I., red.; PONOMAREVA, A.A.,
tekhn.red.

[Planning the development of the Soviet public health service]
Planirovanie razvitiia narodnogo zdravookhraneniia. Moskva, Gos-
planizdat, 1959. 70 p. (MIRA 12:9)
(Public health)

ABROSKIN, Pavel Ivanovich; KOMAROV, Ye.I., red.; GERASIMOVA, Ye.S.,
tekhn.red.

[Industrial specialization and cooperation in an economic
region; practice of the Rostov Economic Administrative Region]
Spetsializatsiia i kooperirovanie promyshlennosti v ekonomicheskom
raione; opyt Rostovskogo ekonomicheskogo administrativnogo raiona.
Moskva, Gosplanizdat, 1959. 112 p. (MIRA 13:2)
(Rostov Province--Industrial organization)

MOVSESIAN, Suren Ambartsumovich; KOMAROV, Ye.I., red.; PONOMAREVA,
A.A., tekhn.red.

[Comprehensive development of industry; practice of the
Economic Council of the Armenian S.S.R.] Kompleksnoe razvitie
promyshlennosti; opyt Sovnarkhosa Armianskoi SSR. Moskva,
Gosplanizdat, 1960. 105 p. (MIRA 14:3)
(Armenia--Economic policy)

TROSHEV, Nikolay Ivanovich; KOMAROV, Ye.I., red.; PONOMAREVA, A.A.,
tekhn.red.

[Planning the distribution of industry in the U.S.S.R.] Plani-
rovanie razmeshcheniia promyshlennosti v SSSR. Moskva, Gosplanisdat,
1960. 125 p. (MIRA 13:11)
(Industries, Location of)

ALAMPIYEV, P.M., red.; OZNOBIN, N.M., red.; OMAROVSKIY, A.G., red.;
KOMAROV, Ye.I., red.; PONOMAREVA, A.A., tekhn.red.

[Problems of production distribution and economic regionalization]
Voprosy razmeshcheniya proizvodstva i ekonomicheskogo raionirova-
niya; sbornik statei. Pod red. P.M.Alampieva, N.M.Oznobina i A.G.
Omarovskogo. Moskva, Gosplanizdat, 1960. 307 p.

(MIRA 13:11)

1. Moscow. Nauchno-issledovatel'skiy ekonomicheskii institut.
(Russia--Industries) (Economic zoning)

BORISOV, B.A., red.; RAZUMOV, M.A., red.; KOMAROV, Ye.I., red.; GERASIMOVA, Ye.S., tekhn.red.

[Organization of industrial management and planning; practice of the Moscow City Economic Council] Organizatsiia upravleniia i planirovaniia promyshlennosti; opyt Moskovskogo gorodskogo sovnareshosa. Moskva, Gosplanizdat, 1960. 273 p. (MIRA 13:7)
(Moscow--Industrial management)

FEYGIN, Ya.g., prof., otv. red.; VASIL'YEV, N.V., doktor ekonom. nauk, red.; MOSKVIN, D.D., kand. ekonom. nauk, red.; SHOKIN, N.A., kand. ekonom. nauk, red.; KOMAROV, Ye.I., red.; GERASIMOVA, Ye.S., tekhn. red.

[Problems of the distribution of productive forces during the period of the large-scale building of communism] Problemy razmeshcheniia proizvoditel'nykh sil v period razvernutoho stroitel'stva kommunizma. Moskva, Gosplanizdat, 1960. 335 p. (MIRA 14:5)

1. Akademiya nauk SSSR. Institut ekonomiki. 2. Institut ekonomiki AN SSSR (for Feygin, Vasil'yev, Moskvina, Shokin)
(Russia--Economic policy)

KOMAROV, Ye.I., red.; PONOMAREVA, A.A., tekhn.red.

[Development of over-all mechanization and automation in industry;
practice of the work of economic councils] Razvitie kompleksnoi
mekhanizatsii i avtomatizatsii v promyshlennosti; opyt raboty
Sovnarkhozov. Moskva, Gosplanizdat, 1961. 227 p.

(MIRA 14:7)

(Industrial management)

(Automation)

OZNOBIN, Nikolay Makarovich; KOMAROV, Ye.I., red.; PONOMAREVA, A.A., tekhn.
red.

[Electric power of the U.S.S.R. and its use] Elektroenergetika
SSSR i ee primeneniye. Moskva, Izd-vo ekonom.lit-ry, 1961. 305 p.
(MIRA 14:12)

(Electric power production)

S/137/61/000/002/026/046
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1961, No. 2, p. 28 # 2E217

AUTHOR: Komarov, Ye. I.

TITLE: Methods of Measuring the Electric Parameters of Welding Conditions

PERIODICAL: "Tr. Saratovsk. in-ta mekhaniz. s. kh.", 1960, No. 20. pp. 7-14

TEXT: Information is given on some general concepts and newly developed methods of measuring electrical parameters of resistance welding conditions. The checking of the conditions can be performed during the measuring of the pulse power, in particular when measured directly on the parts to be welded. Designing of simple and reliable recording devices is of decisive importance. The author analyzes the block circuit diagram and describes a device of simple design that was developed and where the principle of lagmeter was utilized. There are 11 references. ✓

A. P.

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

12300

S/137/61/000/002/022/046
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1961, No. 2, p. 26 # 2E205

AUTHORS: Sokolov, N. M., Komarov, Ye. I.

TITLE: The Effect of the Pulse Shape and the Time of Action of the Welding Current on the Strength of the Weld in Resistance Spot Welding of Non-Ferrous Metals

PERIODICAL: "Tr. Saratovsk. in-ta mekhaniz. s-kh.", 1960, No. 20, pp. 23 - 27

TEXT: For welding non-ferrous metals with high contact electric resistivity the authors suggested a new circuit of the welding pulse generator. The circuit assures preheating at low current and welding at high current pulses. A comparison of results from welding sheet aluminized Fe, 0.2 mm thick, with 0.5 mm diameter platinum wire, on the M 020.005 (I.020.005) machine (welding time - 6 to 7 msec, by one current pulse) and on the new machine (110 msec) has shown that the new circuit ensures welding without burning and poor fusion and reduces straggling of strength data by a factor of 4.4.

G.N.

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

S/137/61/000/002/020/046
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1961, No. 2, p. 26 # 2E203

AUTHORS: Sokolov, N. M., Komarov, Ye. I.

TITLE: Welding Pulse Generator with Extended Range of Welding Conditions

PERIODICAL: "Tr. Saratovsk. in-ta mekhaniz. s. kh.", 1960, No. 20, pp. 29-32

TEXT: Investigations have shown that the time of resistance spot welding of thin parts when extended from 2-20 to 60 msec. considerably improved the quality of weld joints. The described method of proportioning the welding power makes it possible to change welding time from 20 to 140 msec. The proportioning device of the welding pulse generator is assembled according to the conventional circuit with antiparallel connected ignitrons. The welding time is determined by RC-circuits. The suggested circuit can be employed for group feed of low capacity resistance spot welding machines. ✓

V. S.

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

21627

1.2300 1573

S/137/61/000/003/032/069
A006/A101

AUTHOR: Komarov, Ye.I.

TITLE: Combined welding pulse generator with programming

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no.3, 1961, 32, abstract 3F214
("Tr. Saratovsk. in-ta mekhaniz. s.kh", no.20, 1960, 55 - 63)

TEXT: A welding pulse generator is a device intended to control the welding current during resistance welding and assuring the passage of higher current values in the pulse. Due to synchronization from the circuit the welding pulse generator is much simpler than the existing similar devices. The presence of two ignitrons in the power circuit, connected by an anti-parallel system, assures periodic high-power pulses at the generator output, without a constant component. The basic units of the welding pulse generator are: relaxation generator, ignitron ignition control unit (programming device), and synchronizer of the welding units. The relaxation generator creates voltage pulses to control the welding pulse generator performance on the whole; for this purpose a thyatron with 50 to 4 - 5 pulses per second ignition frequency is used in the a-c circuit; the voltage divider assures a sharp ignition angle. The relaxation oscillator pulses are supplied through valves in the negative circuit of the thyatrons. A welding

Card 1/2

KOMAROV, Ye.I.

Reflexes from the receptors of internal organs on blood pressure and respiration during exposure to ionizing radiation. Vop.radiobiol. 2:93-101 '57. (MIRA 12:6)

1. Sotrudnik Tsentral'nogo nauchno-issledovatel'skogo rentgeno-radiologicheskogo instituta Ministerstva zdavookhraneniya SSSR.
(X RAYS--PHYSIOLOGICAL EFFECT) (VISCERA--INNERVATION)
(BLOOD PRESSURE) (RESPIRATION)

KOMAROV, Ye.I.

Effect of ionizing radiation on digestive leucocytosis in
animals. Vop.radiobiol. 2:178-188 '57. (MIRA 12:6)

1. Sotrudnik Tsentral'nogo nauchno-issledovatel'skogo rentgeno-
radiologicheskogo instituta Ministerstva zdavookhraneniya SSSR.
(RADIATION SICKNESS) (LEUCOCYTOSIS)

USSR/Human and Animal Physiology - The Effect of Physical Factors. T
Ionizing Radiation.

Abs Jour : Ref Zhur Biol., No 3, 1959, 13404

Author : Komarov, Ye.I.

Inst : ~~XXXXXXXXXX~~

Title : Change in Unconditioned Interoceptor Reflexes with
the Effect of Ionizing Radiation.

Orig Pub : Med. radiologiya, 1957, 2, No 3, 3-9

Abstract : In experiments on cats (5*0 under urethane dedation
a study was made of reflexes (R) from mechanical re-
ceptors (M) of the intestines and urinary bladder
upon blood pressure (BP) and respiration 1 - 15 days
after total roentgen irradiation of 1200 r. M were
irritated by air inflated into the small and large
intestines and the urinary bladder. BP was taken
in the carotid artery. Changes in R were judged by
the threshold point of irritation of M (in mm of

Card 1/3

Cent. Roentgen Radiology Inst

KEYLINA, R.Ya.; KOMAROV, Ye.I.

Reflex mechanisms of changes in blood sugar level associated with local irradiation of the small intestine by radioactive strontium [with summary in English]. Fiziol.zhur. 44 no.2:148-152 P '58.

(MIRA 11:5)

1. Tsentral'nyy nauchno-issledovatel'skiy rentgeno-radiologicheskiy institut, Leningrad.

(INTESTINES, SMALL, eff. of radiations on
radiostrontium irradiation of exteriorized small intestine
in dog, eff. on blood sugar levels, reflex mechanisms (Rus)
(STRONTIUM, radioactive
irradiation of exteriorized small intestine of dog, eff. on
blood sugar levels, reflex mechanisms (Rus)
(BLOOD SUGAR, physiol,
eff. of radiostrontium irradiation of exteriorized small
intestine of dog, reflex mechanisms (Rus)

KOMAROV, Yef.

69

PHASE I BOOK EXPLOITATION

SOV/5435

Kiselev, P. N., Professor, G. A. Gusterin, and A. I. Strashinin, Eds.

Voprosy radiobiologii. t. III: Sbornik trudov, posvyashchenny 60-letiyu so dnya rozhdeniya Professora M. N. Pobedinskogo (Problems in Radiation Biology. v. 3: A Collection of Works Dedicated to the Sixtieth Birthday of Professor M[ikhail] N[ikolayevich] Pobedinskiy [Doctor of Medicine]) Leningrad. Tsentr. n-issl. in-t med. radiologii M-va zdravookhraneniya SSSR, 1960. 422 p. 1,500 copies printed.

Tech. Ed.: P. S. Puleshuk.

PURPOSE: This collection of articles is intended for radiobiologists.

COVERAGE: The book contains 49 articles dealing with pathogenesis, prophylaxis, and therapy of radiation diseases. Individual articles describe investigations of the biological effects of radiation carried out by workers of the Central Scientific Research Institute for Medical Radiology of the Ministry of Public Health, USSR. [Tsentral'nyy nauchno-issledovatel'skiy institut meditsinskoy radiologii Ministerstva zdravookhraneniya SSSR] during 1958-59. The following

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≡ 69

80V/5435

Problems in Radiation Biology (Cont.)

topics are covered: various aspects of primary effects of radiation; the course of some metabolic processes in animals subjected to ionizing radiation; reactions in irradiated organisms; morphologic changes in radiation disease; and reparation and regeneration of tissues injured by irradiation. Some articles give attention to the effectiveness of experimental medical treatments. No personalities are mentioned. References accompany almost all of the articles.

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Gusterin, G. A., and A. I. Strashinin. Professor Mikhail Nikolayevich Pobedinskiy (Commemorating his Sixtieth Birthday)

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Lebedinskiy, A. V. [Member, Academy of Medical Sciences USSR],
N. I. Arlashchenko, and V. M. Mastryukova. On the Mechanism of Trophic
Disturbances Due to Ionizing Radiation

11

Zedgenidze, G. A., [Member, Academy of Medical Sciences USSR], Ye. A.
Zherbin, K. V. Ivanov, and P. R. Vaynshteyn. Hormonal Activity of the
Adrenal Cortex in Acute Radiation Sickness and the Effect of Desoxy-
corticosterone Acetate on the Disease

17

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7

Problems in Radiation Biology (Cont.)

SOV/5435

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KOMAROV, YE. I.

(d)
The Importance of the Nervous and Pituitary-Adrenal Systems in the
Organism's Reaction to the Effects of Ionizing Radiation

YE. I. Komarov

The initial radiation-induced changes in tissue give rise to an intensification of the impulses received from the receptors of the internal organs, and by bringing the regulatory systems into play this leads to indirect secondary modifications in the organism. These relationships can be clearly demonstrated in experimental models.

After local irradiation of the small intestine with ⁹⁰Sr β-rays (and also after whole-body irradiation), there was an increase in the amount of blood sugar and in the number of leukocytes. At the same time, an increased consumption of O₂ by the tissue of the irradiated intestine was noted. This intensification of tissue respiration is a secondary neuro-endocrine reaction since denervation of the intestine before irradiation forestalls any increase in O₂ consumption but no reflex hyperglycemia or leukocytosis develops. The pituitary-adrenal system is an

essential link in all these changes, for the preliminary removal of one of these endocrine organs forestalls the development of the reactions which we are considering here.

Thus, the irradiation of a large receptor area in the intestine can produce a reflex intensification in the functioning of the pituitary-adrenal system. However, it was not possible to reproduce the above modifications in the organism by direct local irradiation of the pituitary and adrenal glands with the same dose.

The experimental model described here made it possible to demonstrate one of the neuro-endocrine mechanisms of the organism's reaction to the effects of ionizing radiation. The reactions studied are defensive and compensatory; if prevented from occurring at the time of irradiation (this can be done by blocking the mesenteric nerves, by chilling or with novocaine) the animal's death is hastened.

Central Institute of Medical Radiology, Leningrad, USSR

report presented at the 2nd Intl. Congress of Radiation Research,
Harrogate/Yorkshire, Gt. Brit. 5-11 Aug 1962

E 17554-63

EWI(1)/EWI(m)/BDS/ES(j) AMD/AFTTC/ASD AR/K

ACCESSION NR: AT3002371

S/2930/62/000/000/0124/0134

AUTHOR: Komarov, Ye. I. (Leningrad)

TITLE: Blood system reactivity change in radiation sickness 19 56

SOURCE: *oprosam ramney diagnostiki ostroy luchevoj bolezni;*
sbornik nauchnykh rabot. Kiev, Medgiz USSR, 1962, 124-134

TOPIC TAGS: leucocytic reaction, radiation sickness, blood system, eosinophil reaction, adrenal gland

ABSTRACT: The digestive leucocytic reaction in which leucocytes increase after food intake was used to study blood system reactivity changes because it is one of the simplest physiological blood system reactions to observe. After making a blood analysis of cats deprived of food for 12-14 hrs, the cats were given 100 g of meat and 150 ml of milk, and blood was analyzed again after .5, 1, 2, 3, and 4 hrs. Then the animals were X-irradiated (RUM-3 unit, 16-19 r/min) with a total dose of 300 r (15-20% of the animals died within the month). Blood system reactions to stimulation of stomach mechanoreceptors, intramuscular milk injection, and subcutaneous adrenalin injection were studied. It was found that after irradiation the leucocytic

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L 17554-63

ACCESSION NR: AT3002371

reaction to mechanoreceptor stimulation changes. From the 1st to 40th days reactions are absent or are of a leucopenic nature. After the 40th day up to 6 mos reactions are mostly absent and unstable reactions with predominance of leucocytosis begin to appear which are characteristic of the 6 mos-1 yr period during which normal leucocytic reactions are restored. After intramuscular injection of milk (3 ml) no leucocytic reaction is observed the first day and 2-4 days later it is of a leucopenic nature and continues for 1 to 1.5 mos. This phase is followed by unstable reactions and gradually by normal reactions. It was also found that 3-4 hrs after the milk injection eosinophils increase instead of decreasing by 40-50%. Such a change could be explained by disturbed adrenal gland function. To check the hypophysis-adrenalin system function and its effect on blood system reactivity, adrenalin was used for the Thorn (G. W. Thorn) test. In the first month after the adrenalin injection the number of leucocytes changes little, but the number of eosinophils increases 2-3 times. After a month leucocytic and eosinophilic reactions are gradually restored to normal. Blood system leucocytic reactions, especially the leucopenic reaction together with increased eosinophils, can be used as one of the diagnostic tests for radiation sickness and also as a test for hypophysis-adrenalin function. Orig. art. has: 5 figures, 3 tables.

Card 2/72

L 17050-63

AR/K

EWT(m)/BDS/ES(j) AFFTC/ASD

3/205/63/003/002/010/024

AUTHORS:

Il'inskiy, O. B. and Komarov, Ye. I.

57

55

TITLE:

Action of beta radiation on bioelectric activity of single nerve ending (Vater-Paccini body)

PERIODICAL: Radiobiologiya, v. 3, no. 2, 1963, 215-219

TEXT: An attempt is made in this work to observe the changes in the activity of single receptor at the time of irradiation. A very convenient model for conducting such experiments is provided by Paccini bodies located in the mesentery of cats, which are typical mechanical receptors. Experiments were conducted on cats which were anesthetized with a mixture of urethane and chloralose. The effect of β -radiation in the dose of 930 rads on bioelectric activity of single mechanical receptors in the mesentery was investigated. The experiments were conducted at body temperature 36-38°C. The blood supply of receptors was maintained normal. Irritation of nerve ends was advection. It was shown that under the influence of ionizing radiation, the threshold was lowered for the occurrence of commisure in the axon of the receptor. However, in no one of the experiments were there occurrences of impulsion in the quiescent receptor under the influence of radiation. The experiments with irradiation of nerve (n. saphenus) showed the absence of changes of irritability

Card 1/2

KOMAROV, Ye. V. Cand Chem Sci -- (diss) "Study of compounds of Uranium (V) with hydrogen peroxide in solutions of various composition." Len, 1959, 13 pp
(Radium Inst im V. G. Khlopin, Acad Sci USSR), 150 copies (KL, 46-59, 135)

5(4)

AUTHORS:

Komarov, Ye. V., Gurevich, A. M.

SOV/62-59-3-26/37

TITLE:

On the Interaction of Oxalate Complexes of Uranyl With Hydrogen Peroxide (O vzaimodeystvii oksalatnykh kompleksov uranila s perekis'yu vodoroda)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 3, pp 547-550 (USSR)

ABSTRACT:

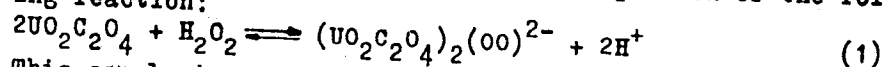
In the present paper the system $UO_2^{2+} - C_2O_4^{2-} - H_2O_2 - H_2O$ was investigated by means of measurements of light absorption and the pH at a $5 \cdot 10^{-4} - 4 \cdot 10^{-3}$ molar concentration of uranium. The optical density of the solutions was measured by means of the spectrometer SF-4, the pH solutions by means of the tube potentiometer of the LP-5 type with a glass electrode. Uranyl perchlorate, sodium oxalate, and perhydrol solutions as well as distilled water without CO_2 -content were employed for the production of the solutions investigated. The results of the measurements are given on figures 1 and 2 as well as in table 1. Three discontinuities of the pH may be seen on the potentiometric curves (Fig 1). The spectrometric investigation has shown

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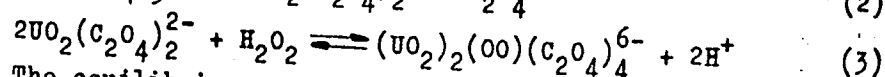
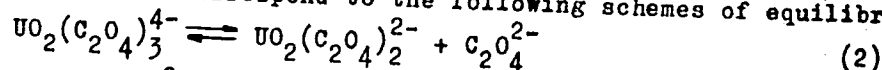
On the Interaction of Oxalate Complexes of Uranyl
With Hydrogen Peroxide

SOV/62-59-3-26/37

that the second and third discontinuity correspond to the formation of the $\text{H}_2\text{U}_2\text{O}_9$ and HU_2O_9 compounds (Ref 3). The first discontinuity is probably due to the completion of the following reaction:



This conclusion agrees with figure 2. The experimental data on table 1 correspond to the following schemes of equilibrium:



The equilibrium constants computed for the reactions (1), (2), and (3) are listed in table 2. After having investigated the conditions for the formation of two peroxyoxalateuranyl complexes in the solution the authors tried to obtain these compounds in solid form. Solid phases of the following composition were obtained: $(\text{NH}_4)_2(\text{UO}_2)_2(\text{OO})(\text{C}_2\text{O}_4)_2 \cdot x\text{H}_2\text{O}$ and $(\text{HOOUO}_2\text{C}_2\text{O}_4)\text{NH}_4 \cdot x\text{H}_2\text{O}$. The solid phase of the composition

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On the Interaction of Oxalate Complexes of Uranyl
With Hydrogen Peroxide

SOV/62-59-3-26/37

$R_6[(UO_2)_2(OO)(C_2O_4)_4]$ aq could not be separated due to its strong solubility. There are 2 figures, 2 tables, and 4 references, 3 of which are Soviet.

ASSOCIATION: Radiyevyy institut im. V. G. Khlopina Akademii nauk SSSR
(Radium Institute imeni V. G. Khlopin of the Academy of Sciences, USSR)

SUBMITTED: July 14, 1958

Card 3/3

5(4)

SOV/78-4-6-16/44

AUTHORS: Gurevich, A. M., Komarov, Ye. V.

TITLE: Investigation of the Polymerization Degree of Some Peruranate Anions in Solution (Izucheniye stepeni polimerizatsii nekotorykh peruranovykh anionov v rastvore)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 6, pp 1309-1312 (USSR)

ABSTRACT: The dissociation character of $\text{Na}_4\text{UO}_8 \cdot 9\text{H}_2\text{O}$ was determined in aqueous solution as well as the polymerization degree of some peruranate anions in the solution. First the polymerization degree of the anion was determined with three peroxy groups to one uranium atom. The dependence of the relative depression (K/K_0) on the molar concentration of the salts was investigated by means of the eutectic ice- KClO_3 and the results are given in figure 1. The results show that the dissociation in aqueous $\text{Na}_4\text{UO}_8 \cdot 9\text{H}_2\text{O}$ -solution proceeds according to the scheme

$$\text{Na}_4\text{UO}_8 \rightleftharpoons \text{UO}_8^{4-} + 4\text{Na}^+$$

The anion UO_8^{4-} exists in the solution as monomer. The polymerization degree of the anion which con-

Card 1/2

SOV/78-4-6-16/44

Investigation of the Polymerization Degree of Some Peruranate Anions in Solution

tains two peroxy groups to one uranium atom was investigated. The dependence of the relative depression (K/X) on the NaCl-concentration and Na_2UO_6 were investigated by means of the eutectic ice- NaNO_3 . The results show that bimolecular peruranate anions exist in peruranates which contain two peroxy groups to one uranium atom. It was found that no polymerization takes place in the case of the hydrolysis in diluted UO_8^{4-} -solutions. The hydrolysis of Na_4UO_8 in diluted solutions proceeds according to the following equation:

$$\text{UO}_8^{4-} + \text{H}_2\text{O} \rightleftharpoons \text{HUO}_8^{3-} + \text{OH}^-$$

The change of the pH-value in the solution $\text{Na}_4\text{UO}_8 \cdot 9\text{H}_2\text{O}$ was investigated at constant ionic strength $\mu = 0.85$. The results are given in figure 3. There are 3 figures and 9 references, 3 of which are Soviet.

Card 2/2

5(4), 21(1)

SOV/78-4-6-17/44

AUTHOR: Komarov, Ye. V.

TITLE: Investigation of Complex Formation in the System
 $\text{UO}_2(\text{NO}_3)_2\text{-KHCO}_3\text{-H}_2\text{O-H}_2\text{O}$ (Issledovaniye kompleksobrazovaniya
v sisteme $\text{UO}_2(\text{NO}_3)_2\text{-KHCO}_3\text{-H}_2\text{O-H}_2\text{O}$)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 6, pp 1313-1323
(USSR)

ABSTRACT: The formation of the peroxycarbonate complexes of uranyl in the case of various ratios of the components was investigated in the system $\text{UO}_2(\text{NO}_3)_2\text{-KHCO}_3\text{-H}_2\text{O-H}_2\text{O}$. The investigations were carried out according to the spectrophotometric and cryoscopic method. Three compounds, $\text{H}_2\text{U}_2\text{O}_9$, $[\text{UO}_2(\text{CO}_3)_3]^{4-}$ and $[\text{UO}_2(\text{CO}_3)_2(\text{OOH})]^{3-}$ are produced in the system $\text{UO}_2(\text{NO}_3)_2\text{-KHCO}_3\text{-H}_2\text{O-H}_2\text{O}$. The dependence of the optic density of the solution on the wave lengths is given in figure 1. The dependence of the optic density of the carbonate complex solutions of the uranyl ion on the pH-value in the solution is given in figure 3. The following reactions

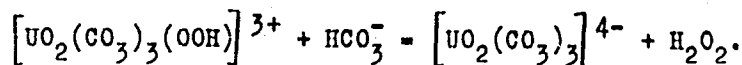
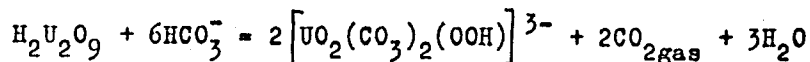
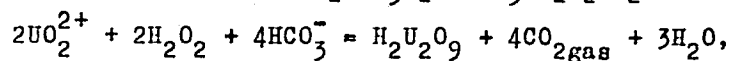
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SOV/78-4-6-17/44

Investigation of the Complex Formation in the System

$\text{UO}_2(\text{NO}_3)_2\text{-KHCO}_3\text{-H}_2\text{O}_2\text{-H}_2\text{O}$

occur in the system $\text{UO}_2(\text{NO}_3)_2\text{-KHCO}_3\text{-H}_2\text{O}_2\text{-H}_2\text{O}$:



The following reaction occurs first in the case of the mixture of an uranyl nitrate solution with hydrogen peroxide:

$2\text{UO}_2^{2+} + 2\text{H}_2\text{O}_2 + \text{H}_2\text{O} = \text{H}_2\text{U}_2\text{O}_9 + 4\text{H}^+$. The addition of KHCO_3 shifts the reaction equilibrium to the right. In the case of further addition of potassium carbonate a peroxycarbonate complex of the uranyl ion is formed. The peroxy carbonate complex of uranyl passes with a considerable excess of potassium carbonate over into the complex

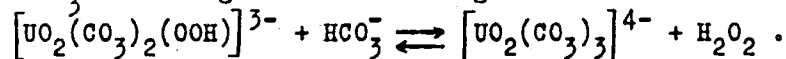
Card 2/4

SOV/78-4-6-17/44

Investigation of the Complex Formation in the System

$\text{UO}_2(\text{NO}_3)_2\text{-KHCO}_3\text{-H}_2\text{O}_2\text{-H}_2\text{O}$

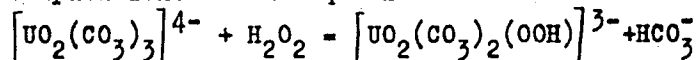
$[\text{UO}_2(\text{CO}_3)_3]^{4-}$. The solution is decolorized with excess KHCO_3 according to the following reaction:



The content of hydrogen peroxide in the complexes was detected according to the method of M. I. Ostromyslenskiy and P. Job (Fig 4), and the ratio $\text{U} : \text{H}_2\text{O}_2$ 1:1 was found. The equilibrium constants of the reaction

$[\text{UO}_2(\text{CO}_3)_3]^{4-} + \text{H}_2\text{O}_2 = [\text{UO}_2(\text{CO}_3)_2(\text{OOH})]^{3-} + \text{HCO}_3^-$ were determined at $\mu = 0.4$ and $\mu = 0$ and the following values were detected:

$K_s = (1.0 \pm 0.3) \cdot 10^{-2}$ and $K_s = (1.6 \pm 0.3) \cdot 10^{-2}$. The dependence of the equilibrium constant on the ionic concentration is given in figure 7. The computations of the equilibrium constants of the reaction



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Investigation of the Complex Formation in the System
 $\text{UO}_2(\text{NO}_3)_2\text{-KHCO}_3\text{-H}_2\text{O}_2\text{-H}_2\text{O}$

SOV/78-4-6-17/44

are given in table 3. The cryoscopic investigations were carried out by means of the eutectic ice - KNO_3 . The dependence of the molecular reduction of the eutectic ice - KNO_3 on the concentration of the uranium content is given in figure 7. The isolation of $\text{K}_3[\text{UO}_2(\text{CO}_3)_2(\text{OOH})]$ from the solution was described. The compounds $\text{U} : \text{CO}_2 : \text{H}_2\text{O}_2 : \text{K}$ in the ratio 1.0 : 2 : 1 : 0.95 : 3.1 were isolated from a solution with the molar ratio of the components $\text{UO}_2(\text{NO}_3)_2 : \text{KHCO}_3 : \text{H}_2\text{O}_2 - 1 : 7 : 1$ and uranium concentration of 0.100 mol by the addition of a diluted ethanol solution (1:2). The ratio of the obtained compounds corresponds to the composition $\text{K}_3[\text{UO}_2(\text{CO}_3)_2\text{OOH}]$. The compound has hitherto not been described in publications. There are 8 figures, 3 tables, and 15 references, 5 of which are Soviet.

SUBMITTED: March 25, 1958

Card 4/4

5(2)

AUTHORS:

SOV/78-4-7-36/44
Komarov, Ye. V., Preobrazhenskaya, L. D., Gurevich, A. M.

TITLE:

On Compounds Forming in the System $\text{UO}_2(\text{NO}_3)_2 - \text{K}_2\text{CO}_3 - \text{H}_2\text{O}_2 - \text{H}_2\text{O}$ (O soyedineniyakh obrazuyushchikhsya v sisteme $\text{UO}_2(\text{NO}_3)_2 - \text{K}_2\text{CO}_3 - \text{H}_2\text{O}_2 - \text{H}_2\text{O}$)

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 7, pp 1667 - 1673 (USSR)

ABSTRACT:

The investigation of the system mentioned in the title was carried out for the purpose of identifying the compounds formed. The concentration of uranium was of the order of magnitude of from 10^{-4} to $2 \cdot 10^{-3}$ mol, the content of other components was varied. Because of the bright color of the uranium solution in carbonate and hydrogen peroxide it was possible to investigate the solution equilibria and the composition of the complex ions spectrographically. Figure 1 gives the data for measuring the optical density in the case of a constant ratio between uranium and hydrogen peroxide and different content of potassium carbonate. At least 3 compounds are formed with different

Card 1/2

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000824110006-9

On Compounds Forming in the System $\text{UO}_2(\text{NO}_3)_2 - \text{K}_2\text{CO}_3 - \text{H}_2\text{O}_2 - \text{H}_2\text{O}$ SOV/78-4-7-36/44

spectrophotometric data. The absorption spectra are represented in figure 2 for the range of 320-500 mμ. Figure 3 gives the values for pH and optical density in dependence on the ratio $\text{CO}_3^{2-} : \text{U}$. The analysis of these data, the titration of H_2O_2 (Figs 4,5), and the cryoscopic investigation (Table 1) lead to the result that the following compounds and complex ions are formed: H_2UO_9 , $[\text{UO}_2(\text{CO}_3)_2(\text{OOH})]^{3-}$, $[\text{UO}_2(\text{CO}_3)_2(\text{OO})]^{4-}$, and an anion that contains two peroxide groups per uranium atom. The light absorption is influenced nearly solely by the compounds uranyl - peroxide group. The dissociation constant for $[\text{UO}_2(\text{CO}_3)_2(\text{OOH})]^{3-} = \text{H}^+ + [\text{UO}_2(\text{CO}_3)_2(\text{OO})]^{4-}$ was estimated at $2.5 \cdot 10^{-11}$. There are 6 figures, 2 tables, and 12 references, 4 of which are Soviet.

SUBMITTED:

March 25, 1958

Card 2/2

21, 3100

22456

S/186/60/002/001/006/022
A057/A129

AUTHORS: Gurevich, A.M.; Preobrazhenskaya, L.D.; Komarov, Ye.V.; Usicheva, N.P.

TITLE: Spectrophotometrical investigation of the system $\text{UO}_2(\text{NO}_3)_2 - \text{ROH} - \text{H}_2\text{O}_2 - \text{H}_2\text{O}$

PERIODICAL: Radiokhimiya, v. 2, no. 1, 1960, 32 - 43

TEXT: In the present work physico-chemical investigations of the system $\text{UO}_2(\text{NO}_3)_2 - \text{ROH} - \text{H}_2\text{O}_2 - \text{H}_2\text{O}$ were made by means of the spectrophotometric method and potentiometric titrations using $10^{-4} - 10^{-3}$ M uranium solutions. In previous papers [Ref. 1: Tr. Radiyevogo inst. im. V.G. Khlopina AN SSSR (Proceedings of the Radium Institute imeni V.G. Khlopin AS USSR), 8, 110 (1958); Ref. 2: ZhNKh, 3, 2512 (1958); Ref. 3: ibid, Ref. 1, 8, 96 (1958)] results concerning hydrolysis and decomposition of the UO_4^{4-} anion have been presented. This research program is continued by the present investigations into the formations and composition of per-uranium anions in the above-mentioned four-component system, whereby the reversibility of the process was studied. Due to the complexity of the system, preliminary investigations with solutions not containing H_2O_2 were carried

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Spectrophotometrical investigation of the system....

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A057/A129

out, and then the effect of some factors on the composition of the solution in the presence of H_2O_2 was studied. Solutions with a certain content of uranium or H_2O_2 and with increasing ratio ROH/U were prepared by: I - adding quickly alkali to the uranyl nitrate solution containing H_2O_2 ; II - adding simultaneously ROH and H_2O_2 -solutions to uranyl nitrate solutions; III - by slow titration with alkali solution [as described in a previous paper, Ref. 4: ZhNKh, 2, 2307 (1957)]; and IV - adding H_2O_2 to the products of hydrolysis of the uranyl ions formed in the investigated system. The pH measurements were made with a glass electrode and ЛП-5 (LP-5) potentiometer, while optical density D was determined on a CФ-4 (SF-4) spectrophotometer. Constancy of the pH and D values in time and reproducibility of the results indicated a true or a metastable equilibrium in the solution. The dependence of D on pH in solutions not containing H_2O_2 demonstrates that different products of hydrolysis exist in the solutions containing $5 \cdot 10^{-4}$ M uranium at pH 3 - 14. According to data published by J. Sutton [Ref. 5: J. Chem. Soc. Iss. no. 2, 275 (1949)], and S. Ahrlund et al. [Ref. 6: Acta Chem. Scand., 8, 1907 (1954)] the present authors assume the formation of the cations $U_2O_5^{2+}$, and $U_3O_8^{2+}$ at pH 3 - 7, while at pH 8 - 14 apparently poly-nuclear anions are formed. Weakly acidic and strong alkaline (pH 14) solutions of the products of hydrolysis are stable and obey Lambert-Beer's law. Between pH 10 and 12 with

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Spectrophotometrical investigation of the system....

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uranium concentrations of $5 \cdot 10^{-4}$ M the optical density changes steadily with time apparently due to polymerization and formation of difficultly soluble polyuranates. The tabulated experimental results obtained with solutions containing H_2O_2 demonstrate that changes in the sequence of mixing of the components or in the time do not change the optical density at pH 6 - 14. Diagrams showing the dependence of D on pH indicate formation of different compounds. By comparison of their absorption spectra the compounds formed in the investigated system $UO_2(NO_3)_2 - ROH - H_2O_2 - H_2O$ ($R = Na^+, K^+$ or NH^+) can be identified. Under certain conditions the same anions are formed in a system with low uranium concentration and in hydrolysis of $Na_4UO_8 \cdot 9 H_2O$ (Ref. 2). According to former investigations $H_2U_2O_9$ is formed in weak acid solutions, while at pH 14 in dependence on the H_2O content formation of polyperuranate $U_4O_{19}^{6-}$ or of the monomer UO_8^{4-} occurs. In the interval of pH 11 - 12 the composition of the solutions depends essentially on: the sequence of mixing of the compounds, the uranium concentration, the ionic strength and the kind of alkali. Discussing the obtained results the authors conclude that in the investigated system (containing H_2O_2) with 10^{-4} - 10^{-3} M uranium concentration and at pH 2 - 14 stepwise formation of complexes occurs. In weakly acidic and strong alkaline solutions the reactions are completely reversible, while at pH 7 - 13 some irreversibility is observed. The latter

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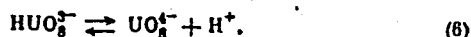
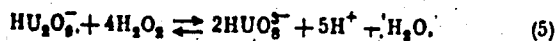
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Spectrophotometrical investigation of the system....

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is due to polymerization effects, which increase with increasing uranium concentration and ionic strength. The difference in degree and character of polymerization can be explained by the existence of compounds with different H_2O_2 content at pH 11 - 12 and different spectrophotometric characteristics (HUO_3^{2-} , $HU_2O_3^{5-}$, $HU_4O_3^{5-}$ or $U_2O_3^{2-}$) non equilibrated. It was observed that in ammoniacal solutions the reaction $UO_3^{2-} + H_2O_2 \rightleftharpoons HUO_3^{2-} + H^+$ is in equilibrium. Considering the present results, conditions can be fixed when only reversible reactions occur, namely the following reactions: $2UO_3^{2-} + 2H_2O_2 + H_2O \rightleftharpoons H_2U_2O_3 + 4H^+$, (3)



In the present paper it is demonstrated that [contrary to conclusions drawn by G. H. Hüttig and E. Schroeder, Z. Anorg. Chem., 121, 243 (1922)] per-uronic acid is a true peroxide compound. The acid properties of compounds with peroxide bridges between the uranyl ions can be explained by an acid dissociation of an aqua-complex according to reactions $[(UO_2)_2(O_2)_2H_2O] \rightleftharpoons H^+ + [(UO_2)_2(O_2)_2OH]^-$ reported by A.A. Grinberg et al. [Ref. 15: Proceedings of the Radium Institute imeni V.G.

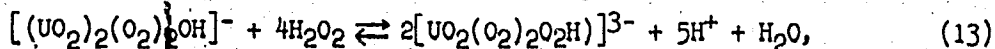
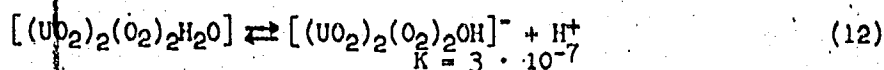
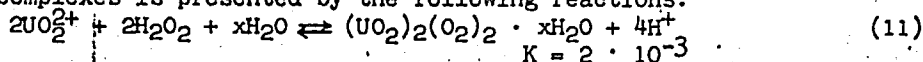
Card 4/8

S/186/60/002/001/006/022

A057/A129

Spectrophotometrical investigation of the system....

Khlopin AS USSR, 7, 74 (1956)]. In the summary reaction $UO_2^{2+} + 3H_2O_2 \rightleftharpoons UO_4^{4-} + 6H^+$ the source of hydrogen ions is H_2O_2 . Thus the UO_4^{4-} ion can be considered as true peroxide complex anion $[UO_2(O_2)_3]^{4-}$, while the HUO_3^{3-} anion can be represented as complex ion $[UO_2(O_2)_2(O_2H)]^{3-}$ which dissociates $[UO_2(O_2)_2(O_2H)]^{3-} \rightleftharpoons H^+ + [UO_2(O_2)_3]^{4-}$. The concept of uranium peroxide compounds as complex compounds of the uranyl ion with hydrogen peroxide anions agrees with some previous results of the present authors [Ref. 19: Izd. AS SSSR, Otd. khim. nauk, 3, 547 (1959)]. Since the existence of such compounds does not agree with the concept of uranium peroxide compounds admitted in classical investigations of Pizazhevskiy, the present authors assume that these compounds have properties of complexes. A suitable nomenclature is given in Table 4 and the reversible stepwise formation of the complexes is presented by the following reactions:

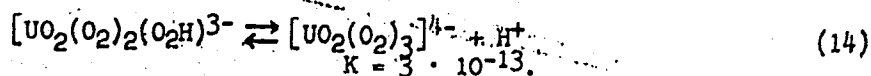


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22456

Spectrophotometrical investigation of the system....

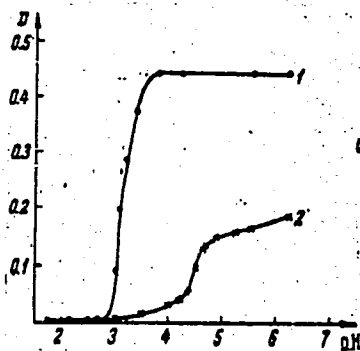
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A057/A129



The mechanism or irreversible formation of poly-nuclear compounds must be investigated in further studies. There are 14 figures, 4 tables and 19 references: 12 Soviet-bloc and 7 non-Soviet-bloc.

SUBMITTED: April 24, 1959

Figure 13: Dependence of D on pH. $C_U = 1 \cdot 10^{-4}$ M;
 $\lambda = 380$ m; $l = 10$ cm. 1 - formation of peracid
 $\text{H}_2\text{U}_2\text{O}_9$; 2 - ion hydrolysis UO_2^{2+} .



Card 6/8

S/186/60/002/005/004/017
A051/A130

AUTHORS: Pushlenkov, M. F.; Komarov, Ye V.; Shuvalov, O. N.

TITLE: The effect of the nature of diluents on the extraction of uranyl nitrate using Tri-N.-Butylphosphate

PERIODICAL: Radiokhimiya, v. 2, no. 5, 1960, 537 - 540

TEXT: A study was made of the effect of certain diluents on the extracting ability of TBPh. where it was established that within the limits of the row investigated, the change in the extracting ability of the TBPh cannot be associated in the same way with the degree of polarity of the diluents. The extracting properties of the TBPh are said to depend both on the degree of dilution and on the nature of the diluent. The authors have studied the effect of both polar and non-polar diluents on the extraction with a solution of TBPh of uranyl nitrate within a wide range of concentrations of the latter. Infra-red spectroscopy was used to determine the various nature of the interaction of the TBPh molecules with different diluents. The manifold recrystallized hexahydrate, uranyl nitrate, was used. The experimental procedure was as follows: The Khar'kov Plant TBPh
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grading chemical reagents were processed with a 5 % solution of sodium alkali and a solution of permanganate and were then dried and distilled under vacuum. Tetrachlorodifluoroethane, tetrachloroethylene, chloroform and bromobenzene were purified by simple distillation. The purity of the organic liquids was checked by the boiling point and specific weight. The uranium was determined by the weight method in the water and organic phases, in the form of U_3O_8 . The TBPh content was determined by the phosphorous according to the weight method in the form of $Mg_2P_2O_7$. The distribution coefficient was calculated as the ratio of the analytical concentrations of uranium in the organic and aqueous phases. The organic layer was a mixture of 40 volume % TBPh and 60 volume % diluent. The experiments were carried out at $20^\circ C$. The infra-red spectra of the pure TBPh and its solutions in carbon tetrachloride, chloroform, and bromobenzene, within the area of valency fluctuation of the phosphorous group, were obtained by means of a MKC-12(IKS-12)-type spectroscope, with a prism made of sodium chloride. The measurements showed that the spectral width of the aperture was about 2 cm^{-1} . All the measurements were carried out with the same cuvette, with openings made of potassium bromide. The absorption coefficient k was calculated according to the formula:

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$$k_v = \frac{1}{C \cdot l} \cdot \log \frac{I_0}{I} .$$

The study of the infra-red spectra of the pure TBPh and its solutions in the carbon tetrachloride, chloroform and bromobenzene led to the conclusion of the various energies of the molecular interaction in all cases. The latter proved that a significant deviation exists in the solutions investigated from that of the ideal state. Figure 1 shows graphically the results of irradiating the distribution of the uranyl nitrate between the aqueous solution and the TBPh mixture with diluents. The threshold value of saturation is reached at concentrations of the uranyl nitrate in water equalling 960 g/l, when the ratio (TBPh) (U) in the organic layer becomes equal to 2. The table shows that an increase of the extracting ability of the TBPh when shifting over to the investigated diluents, from chloroform to tetrachloroethylene, cannot have the same affiliation to the characteristics such as dipole moment (μ), dielectric constant (ϵ) or refractive index (n_D), (Ref. 3: A. Vaysberger, E. Proskauer, Dzh. Riddik, E. Tups, Organicheskiye rastvoriteli, Izd. IL.M., 1958). The authors assume that the change of the extracting ability of the TBPh in various diluents is

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connected with the change of the intermolecular action of the diluents with the TBPh and the disolvate. The solutions of TBPh in chloroform are found to differ most of all from the investigated diluents, which is explained by the fact that an unstable molecular compound of TBPh and the chloroform is formed by means of a hydrogen bond. Experimental data on the TBPh absorption in the region of $1180 - 1300 \text{ cm}^{-1}$, are shown in Figure 2, 3. The spectra show that the absorption intensity changes in different ways depending on the nature of the diluent. There are 1 table and 3 figures. 10 references: 7 Soviet-bloc and 3 non-Soviet-bloc. The three references to English language publications read as follows: Z.J. Dizdar, J. K. Rajnvajn, O. S. Gal, Bull. Inst. Nucl. Sciences "Boris Kidrich", 8, 59, 1958; T. V. Healy, H. A. C. McKay, Trans. Farad. Soc., 52, 5, 633, 1956; R.C. Lord, B. Nilon, H. O. Stidham, J. Am. Chem. Soc., 77, 5, 1365, 1955.

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E071/E485

AUTHORS: Komarov, Ya.V., Pushlenkov, M.F.

TITLE: On the coordination chemistry of uranyl compounds with phosphoroorganic derivatives containing P=O group. I

PERIODICAL: Radiokhimiya, v.3, no.5, 1961, 567-574

TEXT: Absorption spectra of molecular compounds of uranyl bromide, chloride, nitrate and acetate with tri-n-butyl-phosphate (TBPh) in the ranges 6 to 11 μ and 350 to 550 m μ were studied and the differences in the spectra obtained were interpreted in the light of coordination and interaction of the additives in the internal sphere of the complexes. Aqueous solutions of the above uranyl salts were obtained from $UO_3 \cdot H_2O$ and an equivalent amount of the corresponding concentrated acid, taken by weight. Solid $UO_2(NO_3)_2 \cdot 6H_2O$ and $UO_2(CH_3COO)_2 \cdot 2H_2O$ obtained from the above solutions were also used. TBPh after a treatment with alkali and permanganate was distilled in vacuo. The content of uranium and phosphorus in the organic layer was determined colorimetrically. The amount of water in the organic phase and solvates was determined by titration with Fischer's reagent. The measurements of spectra in the range 350 to 550 m μ were done with a Card 1/4

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СФ-4 (SF-4) quartz spectrometer and in the range 6 to 11 μ on an infrared spectrometer with a sodium chloride prism, and windows and cells from potassium bromide. The water content in complexes of uranyl bromide, chloride and nitrate with TBPh was found to be very low and, therefore, the composition of complexes can be expressed as $UO_2A_2(TBPh)_2$, where $A = Br, Cl, NO_2$. On the basis of analogy with uranyl nitrate, it is assumed that the water in dihydrate of uranyl acetate is displaced on the addition of TBPh and does not form an independent phase but dissolves in TBPh with the possible formation of a molecular compound $TBPh \cdot H_2O$. Therefore, the composition of the acetate complex is taken as $UO_2(CH_3COO)_2(TBPh)_2$. On the basis of the absorption spectra obtained, it was shown that ester oxygen of TBPh does not participate directly in the formation of the bond with uranyl but coordination of TBPh molecules takes place only through the phosphoryl oxygen. It was established that in $UO_2Br_2 \cdot (TBPh)_2$ and $UO_2Cl_2 \cdot (TBPh)_2$ complexes, the coordination number of uranyl is 4. It is thought that the decrease in the coordination number could be due to the fact that bromine and chlorine ions on interaction with uranium do not decrease their ionic radii sufficiently, so that spatial

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difficulties for the coordination of the subsequent four atoms of oxygen belonging to the additives arise. However, these purely geometrical considerations do not explain why the coordination number decreases to 4 and not to 5. There is also a possibility that the partially covalent nature of the bonds of uranyl with additives fixes the position of bromine and chlorine about the uranium atom, due to the fixed spatial distribution of orbitals participating in the formation of covalent bonds. The spectra of uranyl complexes in the 350 to 500 mμ range showed a considerable influence on replacing one acid residue by another. This can be explained by a direct interaction of anions with uranium atoms. Thus an interaction of additives in the internal coordination sphere of uranyl in the compounds studied was established. There are 2 figures, 2 tables and 26 references: 16 Soviet-bloc, 2 Russian translations from non-Soviet-bloc publications and 8 non-Soviet-bloc. The four most recent references to English language publications read as follows:

Ref.15: L.L.Burger, J. Phys. Chem., v.62, 5, 590 (1958);
Ref.18: J.Kennedy, Chem. Industry, v.30, 950 (1958);
Ref.22: J.R.Ferraro, J. Inorg. Nucl. Chem., v.10, 3/4, 319 (1959);
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Ref. 24: B.W. Gatehouse, A.E. Comyns, J. Chem. Soc., 3965 (1958).

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214200 also 2209

AUTHORS: Komarov, Ye.V., Pushlenkov, M.F.

TITLE: On the coordination chemistry of uranyl compounds with phosphoroorganic derivatives containing P=O group. II

PERIODICAL: Radiokhimiya, v.3, no.5, 1961, 575-581

TEXT: An investigation of complexes of uranyl bromide, nitrate and acetate with tri-n-butylphosphin oxide (TBPhO) was carried out and the results obtained compared with those previously obtained for similar tri-n-butylphosphate (TBPh) complexes. The reagents and experimental technique were the same as in the previous investigation (Ref.1: Radiokhimiya, v.3, no.5, 567 (1961)). In order to obtain solutions of molecular compounds of uranyl salts with TBPhO, its solution (0.486 M) in benzene was used. Analytical and spectral data indicated that the composition of the complexes formed corresponds to the following formulae: $UO_2Br_2(TBPhO)_2$, $UO_2(CH_3COO)_2(TBPhO)_2$ and $UO_2(NO_3)_2(TBPhO)_2$. The spectral data indicated that the mechanism of coordination of molecules TBPhO and TBPh is the same and is realized through the phosphoryl oxygen. It was established that in the $UO_2Br_2(TBPhO)_2$ complex, similar to the corresponding TBPh complex, the coordination number of uranyl

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equals 4. The nature of changes in the spectra of the TBPh and TBPhO complexes in the range of electron transitions and in the infrared range indicated that the interaction of additives is related to changes in the electron shell of the uranium atom. The values of the differences between $\Delta\nu$ in the series of the compounds investigated are of the second order in comparison to the value of the shift itself, nevertheless, it is shown that the energy equivalent of this effect can lead to sharp differences in the extracting abilities of the corresponding uranyl salts. There are 3 figures, 2 tables and 18 references: 9 Soviet-bloc, 3 Russian translations from non-Soviet-bloc publications and 6 non-Soviet-bloc. The four most recent references to English language publications read as follows: Ref.3: L.L.Burger, J. Phys. Chem., v.62, 590 (1958); Ref.11: J.G.Jones, J.B.Poole, J.C.Tompkinson, R.J.P.Williams, J. Chem. Soc., S.408, 2001 (1958); Ref.17: J.Kennedy, Chem. Industry, 30, 950 (1958); Ref.18: B.W.Gatehouse, A.E.Comyns, J. Chem. Soc., 3965 (1958).

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KOMAROV, Ye.V.

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extraction. Radiokhimiia 4 no.6:633-638 '62. (MIRA 16:1)
(Solvation) (Extraction (Chemistry))

KOMAROV, Ye.V.; PUSHLENKOV, M.F. ; SHURENKOVA, M.Ye.

Factors determining the distribution of inorganic acids between
aqueous and organic phases. Trudy Kom.anal.khim. 14:47-58 '63.
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PUSHLENKOV, M.F., KOMAKOV, Ye.V.

Association of organophosphorus derivatives with chloroform and
the effect of the nature of diluents on the extraction of salts.
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BELOUSOV, V.P.; KOMAROV, Ye.V.; MORACHEVSKIY, A.G.

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KOMAROV, Yu.G.

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